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Backfitting, Forward Fitting, and Issue Finality Guidance

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General Comment

See attached documents

Attachments

This made my head hurt

Professional Experience 3

I am a retired former NRC official. My CV is attached, but the important part is that I served as a project manager for four different power plants, plus the design review for the ABWR, and then as a section chief in the Reactor Systems Branch of NRR, where I oversaw the staff technical review of many different license amendments, and reviews of applications for approval of new fuel and methodologies by reactor vendors and licensees.

I have looked that this NUREG, plus the associated Management Directive, and they made my head hurt. They seem to have been written by someone who has never actually participated in licensing reviews or approvals in NRR. At least during the time I worked at the NRC, from 1980 to 2007. There is no clear explanation why these revisions are needed; there is no statement of a problem that has been identified, with supporting details, from previous backfit actions or other licensing actions that were problematic. This sort of detail should be provided as the basis for making these changes. Without the details, this is an arbitrary and capricious rulemaking.

Commented [KA1]: RC-01

I got to the section on forward fitting, and looked for the definition and the requirements, and it gave me a major headache. The way this is written, licensees can submit license amendment requests for anything, and the staff must either accept the request, exactly as submitted, or deny it, exactly as written. The staff cannot even enter into a dialogue with a licensee about how the request could be revised to address staff concerns, without the staff performing an "analysis" of effects of any staff suggestions to modify the initial proposal.

Commented [KA2]: RC-02

The process of reviewing license amendments at the NRC is a negotiation between the NRC staff and the licensee. There is an exchange of information that takes place, in writing, via the original submittal, requests for additional information by the staff, and subsequent supplemental submittals; and verbally, in meetings and telephone calls. This dialogue takes place, generally, in an open forum that is transparent to the public. As in any negotiation, the two parties exchange information and offers to settle areas of disagreement in an iterative fashion. Each party has access to information that the other party does not, and they gradually reveal this information and make concessions (or make additional demands), as the negation proceeds. At some point they reach agreement on what needs to be done to accept the license amendment, and that is written down in a final licensee submittal and a staff SER.

Many license amendment requests ask for approval to use different equipment, analytical methods, different materials, or different procedures than have been approved in the past, for the facility making the request, or even for any similar operating facility. The guidance document does not explain how the staff makes an "adequate protection" determination. After spending 25 years at the NRC, I cannot describe the exact steps that need to be met to make an "adequate protection" determination without seeing the actual application. When I worked in the Reactor Systems Branch I would get about 1 request every 2 weeks for permission to do something that no one had ever thought to do before. There was no precedent for what was requested and no accepted staff guidance for making the determination that the request provided "reasonable assurance of adequate protection. " This **conclusion** is something that is usually reached at the end of the dialogue between the staff and the licensee. In rare cases, it is obvious from the very beginning that the request is unacceptable – I can think of one idea proposed by a fuel vendor that caused me to laugh out loud and tell the vendor to go away and never come back with that request ever again. They went away.

The general rule was that there were several different ways that could provide a basis for acceptance of a proposal: (1) It had been accepted before for another plant, and the request was identical in all

respects to the previously approved plant; (2) The licensee or vendor had performed calculations using approved methods to provide an analysis that showed that the proposal met previously approved acceptance criteria; (3) The licensee or vendor had performed tests to demonstrate that the behavior of the new component/system/plant would conform to previously accepted criteria; (4) The licensee/vendor had performed calculations using a new method which was submitted to the staff for review and approval as part of the amendment request; (5) The staff had performed its own calculations/research of the component/materials/system behavior to determine that the proposal met previously approved criteria; (6) The licensee/vendor performed tests and calculations to support the development of new acceptance criteria; and (7) the staff performed its own tests and calculations to confirm the results of the licensee's tests and calculations; or (8) the licensee application quoted an approved guidance document that stated that it could use the requested alternative analytical method/component/system.

The example presented in p 3-3 of the guidance document about requiring the modification of a fence height because of a request for a change to a diesel generator requirement seems to make sense, but there are many interactions among safety criteria that make it impossible to implement. I can think of several issues related to the approval of the design criteria for the AP1000 which were not resolved with the rulemaking that accepted the design, because they were either too hard(sump screen design), too preliminary (I&C design), or something that would have to be dealt with by the licensee, when the plant is actually built (seismic). These issues are non-trivial and cannot be said to have been resolved with any finality. They are also quite complicated because they relate to several disciplines and have implications for fundamental aspects of the design (sump screens). Similar issues exist in operating reactors.

Commented [KA3]: RC-03

The forward fitting criteria require the staff to perform some sort of cost analysis of any initiative that the staff believes should be taken in order to approve a proposed license amendment.

The staff is not able to perform such analyses. The staff does not have access to all the detailed engineering details or costs to the licensee associated with making engineering changes. It would have to speculate about those costs, and even technical details, in order to perform the "analysis" that is required. The staff would therefore be placed in the situation of either accepting the proposal, as-is, or denying it. I predict that the staff will take the second option, in almost every case, because there is no other reasonable option.

Commented [KA4]: RC-04

This proposal will destroy the license amendment process. It is unworkable and needs to be abandoned. Alternatively, if NRC management thinks that it is really needed, it should proceed with a formal rulemaking, rather than imposing this "guidance" on the staff by way of a Management Directive. The detailed basis for the rulemaking should be provided, with examples of cases where the existing guidance and regulation were not appropriate. The public, which has a stake in this process, needs to understand what is happening here, and why.

Commented [KA5]: RC-05

Professional Experience - Ralph Caruso

2003-2007

Senior Staff Engineer, Advisory Committee on Reactor Safeguards

Served as senior staff engineer at the ACRS, coordinating meetings of the Committee and several subcommittees, as well as liaison with the NRC staff and other affected stakeholders in the areas of thermal-hydraulic analyses and analytical methods, reactor fuels, reactor power uprates, and other issues associated with reactor and containment systems.

1997 - 2003

Chief, BWR and Nuclear Performance Section, Reactor Systems Branch, NRR

Supervised 16 reactor systems engineers who perform reviews of reactor licensing issues and other special projects, as required. Areas of responsibility included (1) all reactor safety system issues for Boiling Water Reactors (BWRs), (2) all regulatory aspects of operating reactor fuel behavior for all operating power reactors in the United States, (3) thermal hydraulic, neutronics, and reactor fuel computer code evaluations for BWRs and Pressurized Water Reactors(PWRs), and (4) reviews of new advanced reactor designs (ESBWR, SRW-1000, ACR-700, BPMR, and GTMRH). Under my direction, this organization also performed thermal-hydraulic (T/H) analyses of various reactor transient and accident scenarios in support of licensing reviews, and in response to operating reactor events and inspections. Analyses were performed by NRC staff members, using NRC- and vendor-developed computer codes. As a part of this function, I was responsible for maintaining the high-performance UNIX computer network within NRR that was used by three separate divisions to perform technical calculations and to provide database services for the office.

1992-1997

Group Leader, Analytical Support Group(ASG), Division of Systems Safety and Analysis(DSSA)

Reporting directly to the Division Director, I created the ASG in response to a Commission decision to re-establish a T/H analytical capability within NRR. The need for this capability was identified during the AP600 and SBWR reviews. During this period, I (1) selected the five staff members who served in the ASG, (2) managed the selection, procurement, configuration, installation and operation of the computer workstations and their associated high performance network, (3) managed the training of the staff in the use of the NRC reactor and containment T/H codes, and (4) supervised the use of these codes to perform reactor analyses. Over 50 analyses were performed for operating reactors and advanced reactors during this period, at the request of every branch within DSSA, and also in response to requests from RES, NMSS, and AEOD.

1991-1992

Technical Assistant to the Director, Division of Systems Technology (DST)

Served as a highly qualified technical specialist, directly assisting the Director. Responsible for a broad variety of technical safety matters relating to nuclear power plants. Provided expert technical guidance in the resolution of issues at operating plants, and provided advice in the prioritization of tasks assigned to the Division. Was responsible for developing policies for the review and approval of new designs.

1987-1991

Administrator, Reactor Safety Division, Nuclear Energy Agency (NEA), Paris, France

Served as an Administrator(Scientific Secretary), responsible for the organization and conduct of technical meetings of nuclear safety experts from regulatory and research organizations, industry, and academic institutions in the NEA member countries. Meetings included working groups, technical, and program management review meetings for joint projects such as Halden (Norway), OECD-LOFT (US), and the Upper Plenum Test Facility (Germany). The technical content of the meetings focused on reactor fuel behavior and the thermal-hydraulics of reactor coolant systems during reactor transients, loss-of-coolant accidents, and severe accidents. Duties included organization of the meetings, preparing agendas, providing guidance to the various groups, analysis of technical data, preparation of working documents, and liaison with national and international organizations such as the IAEA and the European Community. As a collateral duty, I assisted in the installation of an office automation system using microcomputers and VAX minicomputers.

1986-1987

Advanced Reactors Project Manager, NRR

Initiated the design approval review for a new design of nuclear power plant, including the development of new policy options for performing the review, and coordination of the technical review process among diverse technical disciplines. Also responsible for interactions with industry associations, foreign governments, and utilities, and other foreign reactor vendors who were partners with General Electric in the development of the Advanced Boiling Water Reactor.

1983-1986

Licensing Project Manager, NRR

Managed and coordinated the efforts of the NRC technical staff, consultants, and contractors in achieving a timely and balanced evaluation of the safety and environmental matters associated with the design, construction, testing, and operation of the Shoreham Nuclear Power Station. This involved the resolution of inconsistencies and differences of opinion between the NRC staff and the utility through knowledge of the technical issues and the applicable legal requirements. It also required extensive effort in the preparation of testimony and the coordination of that of other staff members

during four separate sets of public hearings before the Atomic Safety and Licensing Board, the Atomic Safety and Licensing Appeal Board, and the Commission, itself. The intense public interest in this project required the preparation of many responses to public, press, and congressional inquiries. As a collateral duty, served on a major NRC task force which evaluated the suitability of certain emergency diesel generators for use at nuclear power plants.

1980-1983

Operating Reactors Project Manager, NRR

Responsible for the management and coordination of all licensing work related to the Yankee Nuclear Power Station (Yankee-Rowe), the LaCrosse Boiling Water Reactor, and the Haddam Neck Plant (Connecticut Yankee). Performed ongoing reviews of the facilities as part of the Systematic Evaluation Program, which involved a comprehensive review and evaluation of older operating facilities to determine and document the acceptability of their departures from current requirements. Performed an Integrated Assessment of the need for safety improvements at Yankee. Awarded the NRC Special Achievement Certificate for the identification of a reactor safety problem.

1979

Reactor Engineer, Stone and Webster Engineering

Prepared and reviewed system flow diagrams, piping and machinery arrangements, and Safety Analysis Report revisions. Coordinated changes to reactor plant systems with other engineering disciplines, and performed detailed equipment and system analytical calculations. Responsible for the review and implementation of NRC Regulatory Guides and Standard Review Plans for boron recovery and radioactive waste systems.

1972-1978

United States Navy Nuclear Power Program, USS South Carolina(CGN-37) and D1G Prototype

Responsible for proper water chemistry controls for two PWRs aboard the South Carolina, as well as personnel radiation dosimetry and radiological controls (health physics) throughout the ship. Wrote and implemented water chemistry and radiological controls procedures during construction of, and following initial startup of the ships nuclear reactors. Stood watch as the Engineering Officer of the Watch, in charge of the operation of ship's nuclear power plants.

At D1G, supervised the training of officers and enlisted in the operation of naval nuclear power plants. Supervised the operation, training, and maintenance practices of the operating crew, coordinated the training of assigned students, and developed work procedures used in complex reactor plant maintenance. Certified as Chief Engineer by the Director, Division of Naval Reactors.

Education and Training - Principal Highlights

1972 Bachelor of Science in Chemical Engineering, Carnegie-Mellon University
1973 Naval Nuclear Power Training
1980 MIT Reactor Safety Course
1984 BWR Simulator Course, US NRC, Chattanooga
1994 RELAP5 Training - Idaho National Engineering Laboratory

Have taken many additional courses on management techniques, computer applications, and technical aspects of nuclear reactor design, operation, and regulation.

Personal Information
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